crossing each circle during the month of January or in other words the number of cyclones passing within 200 miles of the centers of the circles.

These average figures were then plotted upon a blank map at the centers of their corresponding circles. By interpolation, isoclones were drawn permitting values to be read for localities other than those at the centers of the construction circles.

Both individually and in comparison with others this isoclonic chart shows several interesting facts.

The influence of land and water on the place-frequency of storms is apparent from the shapes of the isoclones.

In the Pacific Coast Region the normal southeasterly trend of the isoclones is distorted by the prevalence of stagnant HIGHS in the dry, cold Plateau Region. That the majority of the North Pacific LOWS are forced to enter the continent at high latitudes and to move due east until the Rocky Mountains are crossed before turning southeastward, is plainly indicated by the chart.

In the lee of the Rockies the origin of the Colorado LOWS is evidenced by a well defined isoclonic maximum. The source of Texas LOWS is likewise clearly indicated.

The marked southerly trend of the isoclones in the Mississippi Valley is probably due to a number of causes, such as increased moisture supply, flat topography, and the closing together of the paths of South Pacific, Colorado, and Texas LOWS. The high maximum over the Great Lakes is due again chiefly to moisture supply, flat topography, the confluence of many storm paths, and, in addition, to the southward pressing effect of the Hudson Bay HIGH.

The presence of the Appalachian System is shown by the isoclonic minimum in that region. Further eastward the Atlantic Ocean causes a southerly dip in the isoclones before they are pushed to the north by the Bermuda HIGH.

A minor juncture of storm paths is marked by an isoclonic maximum off Newfoundland.

The steep gradient between Hudson Bay and the Great Lakes is probably more apparent than real. The use of Canadian Weather Service maps would no doubt have modified the chart in that locality.

In conclusion it may be pointed out that this type of chart, as well as being of general climatic interest, is of particular value, due to its construction, in investigations of the effects of cyclonic frequency upon health and human efficiency.

CORRELATION IN SEASONAL VARIATIONS OF WEATHER—A FURTHER STUDY OF WORLD WEATHER [7]

By GILBERT T. WALKER

[Abstracted by A. J. Henry]

This paper is a continuation of the series, Correlation in Seasonal Variations of Weather, begun in Part IV of volume 24 of the Indian Meteorological Memoirs. In that paper Doctor Walker presented the results of a preliminary study of the relationships between 17 centers of action of which 15 were centers for pressure and 2 for rainfall.

Since the publication of the memoir just mentioned the survey of the relationships has been carried a step farther, and the author now presents data of relationships for the entire year, whereas in the earlier publication the data were applicable only to summer and winter.

The number of years of data for the several centers of action is roughly 43 for the great majority of centers and but about 20 for Samoa and Alaska. In discussing the significance of correlation coefficients derived from records varying in length as indicated it is pointed out that the probable value of a correlation coefficient based on random data would be 0.151 and 0.103 for the long and short series, respectively.

In the Alaska or Samoa tables there will be found in the column for contemporary quarters 17 coefficients with other centers based on data of about 20 years; so that the probable value of the greatest of 17 random coefficients is 0.151×3.04 or 0.459.[8]

Two tables are presented in which the probability of a number of random coefficients exceeding certain limiting values (0.459 in the longer series and 0.305 in the shorter) is given. From these tables it is concluded that the probability of a random coefficient diminishes rapidly with growth in its size. It follows therefore for the short-period records of Alaska and Samoa that though it is as likely as not that one of the random coefficients will exceed 0.46 there is a chance of only about 1 in 3 of the greatest exceeding 0.5, 1 in 5 exceeding 0.55, 1 in 9 of exceeding 0.6, and 1 in 34 of exceeding 0.7. For the long record stations this feature is still more pronounced, the chance of one coefficient exceeding 0.6 is only 1 in 380 times.

The so-called centers of action of greatest interest to North American meteorologists are, perhaps, those of Alaska, Honolulu, and Charleston. For this reason the full tables of correlation coefficients between these centers and other distant centers as worked out by Doctor Walker are presented below. Doctor Walker's comment upon each table is also reproduced.

[7] Calcutta, Indian Meteorological Memoirs, 24, Part IX, pp. 275-332.

[8] For the development of this expression the reader is referred to Vol. XXI, Part IX, p. 15, Ind. Met. Mem.

ALASKA PRESSURE

		December-February					March-May						June-August					September-November				
	Years of data	Two quarters before Alaska	One quarter before Alaska	Same quarter	One quarter after Alaska	Two quarters after Alaska	Two quarters before Alaska	One quarter before Alaska	Same quarter	One quarter after Alaska	Two quarters after Alaska	Years of data	Two quarters before Alaska	One quarter before Alaska	Same quarter	One quarter after Alaska	Two quarters after Alaska	Two quarters before Alaska	One quarter before Alaska	Same quarter	One quarter after Alaska	Two quarters after Alaska
		J-A	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*		*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*
Iceland	21	+0.06	+0.42	−0.18	−0.12	+0.20	−0.10	+0.22	−0.20	+0.14	−0.22	22	0.00	+0.26	+0.56	+0.36	+0.26	+0.26	−0.26	+0.06	−0.30	−0.04
Alaska	22	+.04	+.24	+1.00	−.12	−.02	−.16	−.12	+1.00	−.12	−.54	23	−.02	−.12	+1.00	+.04	+.04	−.54	+.04	+1.00	+.24	−.16
C. Siberia	17	−.28	+.50	+.18	+.22	+.32	−.16	−.06	+.30	−.30	+.22	17	+.44	.00	+.28	−.52	−.24	−.06	−.08	−.08	.00	+.02
Vienna	17	−.06	−.06	−.36	−.36	+.12	+.24	−.06	−.24	.00	−.12	18	−.32	−.38	+.30	−.26	+.06	+.30	+.02	+.46	+.42	−.06
Azores	21	+.08	−.02	+.24	−.14	−.48	+.08	−.38	+.26	+.04	+.16	22	−.14	+.02	−.32	−.18	−.28	−.16	+.24	−.30	+.16	−.06
Charleston	20	.00	−.24	+.36	−.42	−.28	+.20	−.32	+.14	+.16	−.32	21	+.02	+.06	+.18	−.40	−.14	−.14	−.12	+.32	+.32	−.20
San Francisco	21	+.24	−.08	−.22	−.48	+.04	+.06	−.12	−.14	+.24	−.28	22	−.12	+.14	+.18	−.38	−.10	+.34	−.02	+.30	+.16	−.04
Tokio	18	−.02	−.18	−.22	−.02	+.10	+.22	.00	+.04	−.20	+.14	19	+.32	−.18	+.04	−.22	−.02	+.10	+.26	−.16	+.18	−.22
Cairo	18	+.08	+.36	−.28	−.26	+.12	−.08	−.24	.00	−.18	−.26	19	−.12	−.14	−.42	−.24	−.30	+.38	+.30	+.36	+.52	+.20
Honolulu	19	+.22	−.14	−.70	−.14	−.12	−.02	−.26	−.52	−.44	+.16	20	−.04	−.30	−.28	−.24	−.14	+.50	+.42	−.22	−.06	−.08
N. W. India	21	−.28	+.18	−.08	+.16	−.04	+.20	+.20	+.38	−.48	+.20	22	+.02	+.18	−.22	−.08	+.24	−.14	+.20	−.22	.00	+.02
Port Darwin	20	−.12	−.24	−.24	+.28	−.24	+.08	+.30	+.32	+.34	+.44	21	−.12	+.14	+.26	+.16	+.18	−.36	−.10	−.30	−.06	−.24
Mauritius	21	−.26	−.10	+.08	+.24	−.22	−.18	+.32	−.18	+.18	+.12	21	.00	+.26	+.22	−.22	−.24	+.18	+.08	−.08	−.22	+.20
Samoa	4	(+.4)	(+.1)	(−.2)	(−.1)	(−.2)	(−.5)	(−1.0)	(−.7)	(−.7)	(−1.0)	4	(+.1)	(−.5)	(−.4)	(+.2)	(−.4)	(+.2)	(+.4)	(+.9)	(+.4)	(+.7)
S. E. Australia	21	−.04	−.06	−.14	+.32	−.50	−.20	+.14	+.64	+.36	+.24	22	−.34	+.20	+.06	+.10	+.06	−.12	+.22	+.02	−.10	−.32
Cape	21	−.18	+.64	−.52	−.42	+.04	−.14	−.04	+.06	+.04	+.04	22	−.02	+.20	−.04	−.28	+.16	+.14	+.32	+.10	+.06	+.16
S. America	21	+.04	+.16	−.08	+.14	−.02	+.02	+.02	−.28	+.06	−.26	22	−.34	+.08	−.06	−.12	−.06	+.04	+.16	−.10	+.12	.00
Temperature																						
Dutch Harbor	18	......	+.62	+.68	+.04	......	......	+.22	+.48	−.46	+.08	19	......	−.12	+.12	+.24	......	−.56	+.10	.00	+.10	......
Rain																						
Peninsula (J–S)	22	+.66	......	......	......	−.36	......	......	......	−.04	......	22	......	......	−.12	......	......	......	+.30	......	......	......
Java (O–F)	19	......	......	+.34	......	......	......	−.02	......	......	......	19	+.06	......	......	......	−.08	......	......	......	−.04	......

ALASKA PRESSURE

The coefficients with Samoa are inserted in brackets because there are only four years in which the series overlap. Of the contemporary winter coefficients two are about 0.7; that with Honolulu shows clearly the strong opposition between the areas of high and low pressure in the North Pacific, though at San Francisco and Tokyo this is but slightly marked, and the other that accentuation of the North Pacific low pressure leads to lower temperatures at Dutch Harbor on its northern margin. The coefficients with the Cape in the contemporary and previous quarters involve too much discontinuity for stations so far apart and are doubtful. Of coefficients of seasons separated by one quarter the only other one exceeding 0.52, the probable random greatest value, is Dutch Harbor and there the relationship is probably real.

In spring the same relations with Honolulu and Dutch Harbor persist; and the data of four years comparison with Samoa suggest that the opposition in the Pacific extends southwards across the equator.

In summer the area of low pressure has almost disappeared and the only probable contemporary relationship is one of sympathy with Iceland; the noncontemporary relationships are all uncertain.

In autumn the opposition with Honolulu has not yet developed, and the strong sympathy with Samoa which is suggested by the 4 years of comparison available is not supported by the previous or succeeding quarters. Of the noncontemporary coefficients the biggest of the two groups excluding Dutch Harbor have values of 0.50 and 0.52, practically identical with that produced by pure chance; these must therefore be ignored.

HONOLULU PRESSURE

		December-February					March-May						June-August					September-November				
	Years of data	Two quarters before Honolulu	One quarter before Honolulu	Same quarter	One quarter after Honolulu	Two quarters after Honolulu	Two quarters before Honolulu	One quarter before Honolulu	Same quarter	One quarter after Honolulu	Two quarters after Honolulu	Years of data	Two quarters before Honolulu	One quarter before Honolulu	Same quarter	One quarter after Honolulu	Two quarters after Honolulu	Two quarters before Honolulu	One quarter before Honolulu	Same quarter	One quarter after Honolulu	Two quarters after Honolulu
		J-A	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*		*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*
Iceland	37	0.00	−0.16	−0.18	−0.10	−0.04	+0.06	+0.06	−0.06	−0.16	+0.16	38	−0.06	+0.06	−0.34	−0.06	0.00	−0.10	[1] 0.20	−0.12	−0.20	−0.10
Alaska	19	−.14	−.06	−.70	−.26	−.04	−.08	−.14	−.52	−.30	+.50	20	−.12	−.14	−.28	+.42	+.22	+.16	−.24	−.22	−.14	−.02
C. Siberia	33	−.20	−.28	−.30	+.14	−.38	−.22	+.10	−.02	−.34	+.24	33	+.06	−.04	−.16	−.30	−.08	+.26	−.20	+.42	−.14	+.02
Vienna	35	−.20	+.08	−.04	+.10	−.14	−.10	−.14	+.18	−.40	+.08	35	+.10	+.12	−.26	+.12	+.10	+.16	−.03	−.02	−.04	+.26
Azores	38	+.16	−.14	+.14	+.16	+.20	−.34	−.06	−.14	+.06	−.14	38	+.08	−.24	+.20	+.14	−.08	−.04	−.04	+.20	−.02	−.02
Charleston	37	+.10	+.04	−.20	+.20	+.20	−.10	−.12	−.08	+.04	+.30	37	+.10	−.14	−.08	+.10	+.30	−.40	−.18	−.08	+.22	−.02
San Francisco	39	+.14	+.10	+.14	+.18	+.20	+.04	+.14	+.14	.00	+.40	39	+.04	+.22	+.14	+.36	+.08	−.32	+.02	+.26	+.02	+.10
Tokio	38	−.12	−.02	+.40	−.02	−.10	−.06	−.20	+.04	−.06	+.22	38	−.22	+.08	+.40	−.06	−.24	+.24	+.30	−.02	+.04	−.02
Cairo	36	+.18	−.02	+.20	+.34	+.10	−.20	−.10	+.28	+.08	+.18	36	−.12	−.06	−.06	+.14	−.28	.00	+.08	+.02	−.20	−.10
Honolulu	39	−.16	+.12	+1.00	+.44	+.12	.00	+.44	+1.00	+.52	+.24	39	+.12	+.52	+1.00	+.44	−.16	+.24	+.44	+1.00	+.12	.00
N. W. India	38	+.08	+.22	+.14	+.12	+.12	+.04	−.06	−.04	+.24	−.32	38	−.28	−.22	.00	−.42	−.30	+.30	+.10	−.32	−.22	−.14
Port Darwin	38	+.46	+.48	+.38	+.02	+.12	+.14	+.08	−.06	−.38	−.44	38	−.34	−.54	−.66	−.68	−.64	−.04	−.20	−.24	−.30	−.26
Mauritius	38	+.30	−.02	−.26	−.06	−.18	+.08	−.30	+.10	−.22	−.12	38	−.30	−.06	−.22	+.16	−.10	−.24	+.02	+.04	−.12	−.18
Samoa	20	+.08	+.38	+.20	.00	+.04	+.02	+.38	+.48	+.10	+.60	20	+.46	+.42	+.74	+.22	+.50	+.20	+.44	+.42	+.56	+.28
S. E. Australia	38	+.28	+.30	+.32	−.10	+.20	+.06	+.14	−.14	−.16	−.30	38	−.24	−.46	−.28	−.38	−.54	−.26	−.04	−.04	−.30	−.18
Cape	38	+.16	−.20	+.30	+.10	.00	−.38	−.04	−.20	−.06	−.06	38	−.28	−.16	−.08	+.04	−.42	−.10	+.02	−.14	−.22	+.06
S. America	38	+.12	+.10	+.06	−.04	+.18	−.06	+.18	+.14	+.24	+.34	38	.00	+.30	+.52	+.32	−.06	−.02	+.24	+.32	−.08	+.28
Temperature																						
Dutch Harbor	35	......	−.08	−.24	−.16	......	......	−.18	−.22	+.04	......	35	......	−.40	−.04	−.20	......	+.02	−.12	−.22	−.02	......
Rain																						
Peninsula (J–S)	39	−.42	......	......	......	+.26	......	......	......	+.30	......	39	......	......	+.46	......	......	......	+.02	......	......	......
Java (O–F)	36	......	......	−.32	......	......	......	−.06	......	......	......	36	−.14	......	......	......	+.40	......	......	......	+.30	......

[1] Sign omitted in original.

CHARLESTON PRESSURE

	Years of data	December-February					March-May					Years of data	June-August					September-November				
		Two quarters before Charleston	One quarter before Charleston	Same quarter	One quarter after Charleston	Two quarters after Charleston	Two quarters before Charleston	One quarter before Charleston	Same quarter	One quarter after Charleston	Two quarters after Charleston		Two quarters before Charleston	One quarter before Charleston	Same quarter	One quarter after Charleston	Two quarters after Charleston	Two quarters before Charleston	One quarter before Charleston	Same quarter	One quarter after Charleston	Two quarters after Charleston
		J-A	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*		*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*	*J-A*	*S-N*	*D-F*	*M-M*
Iceland	46	−0.06	+0.16	−0.32	−0.16	−0.20	+0.10	−0.18	−0.36	+0.14	+0.02	46	−0.12	−0.24	−0.02	−0.10	+0.04	−0.10	+0.02	−0.20	+0.02	−0.12
Alaska	20	−.14	+.32	+.36	−.32	+.02	−.20	−.42	+.14	+.06	−.14	21	−.28	+.16	+.18	−.12	.00	−.32	−.40	+.32	−.24	+.20
C. Siberia	40	−.36	+.12	−.30	−.32	−.04	−.20	−.34	−.32	−.24	−.26	40	−.18	−.10	−.26	−.22	−.16	+.34	−.02	−.20	−.04	+.24
Vienna	43	−.20	−.14	+.24	+.02	+.30	−.02	+.16	+.16	+.08	+.12	43	+.02	.00	+.16	+.10	−.04	+.14	−.12	+.22	−.04	+.32
Azores	45	−.04	+.02	+.36	+.14	+.12	−.06	−.10	+.52	+.12	−.22	45	+.02	+.38	+.26	−.08	−.10	−.16	−.04	+.12	−.14	+.02
Charleston	47	−.10	.00	+1.00	+.22	+.18	+.20	+.22	+1.00	+.52	+.06	47	+.18	+.52	+1.00	.00	−.10	+.06	.00	+1.00	.00	+.20
San Francisco	47	−.08	+.30	+.20	+.18	+.24	+.24	+.44	+.36	+.42	+.06	47	+.40	+.24	+.48	−.06	−.04	+.16	+.04	+.54	+.34	+.48
Tokio	38	−.06	+.08	+.24	.00	−.08	−.04	+.36	+.10	−.28	+.04	38	+.36	+.10	−.08	−.34	.00	+.14	+.18	+.14	+.06	−.20
Cairo	44	.00	+.24	+.08	−.20	+.10	−.04	+.04	+.06	+.06	−.06	44	−.20	−.22	−.14	−.30	−.16	+.06	−.06	−.12	−.04	+.18
Honolulu	37	+.30	+.22	−.20	−.12	+.10	−.02	+.20	−.08	−.14	−.40	37	+.20	+.04	−.08	−.18	−.10	+.30	+.10	−.08	+.04	−.10
N. W. India	45	−.02	−.42	−.52	−.46	−.30	−.22	−.28	−.36	−.28	+.42	45	−.14	−.24	−.52	+.20	+.24	−.02	+.04	−.20	−.22	−.32
Port Darwin	38	−.30	−.50	−.52	−.28	−.22	+.04	−.02	−.02	+.34	+.34	38	+.04	−.12	+.12	+.10	+.24	+.06	−.02	.00	+.02	−.04
Mauritius	45	−.02	+.06	−.12	+.10	+.06	−.22	−.44	−.06	+.08	−.02	45	−.20	−.14	+.10	−.14	−.06	−.28	−.24	+.14	+.06	−.12
Samoa	20	+.20	+.20	+.28	+.06	.00	+.38	+.26	−.12	−.20	−.36	20	+.32	−.04	−.22	−.38	−.08	−.26	−.10	+.04	+.24	−.04
S. E. Australia	44	−.24	−.38	−.30	−.28	−.22	−.26	−.16	−.18	+.02	+.08	44	−.04	−.06	−.12	+.06	+.12	−.02	−.26	−.12	−.16	−.18
Cape	45	+.08	+.08	−.26	+.10	+.18	−.12	−.04	+.08	−.12	+.10	45	−.10	−.04	−.16	−.02	+.02	−.06	+.12	−.22	−.16	+.22
S. America	45	+.20	+.14	−.08	+.22	+.08	+.34	+.02	+.12	−.06	+.20	45	+.06	+.10	+.04	+.04	+.44	+.20	+.04	+.22	−.04	+.26
Temperature																						
Dutch Harbor	36	......	−.14	−.08	−.18	......	......	−.34	+.24	+.18	+.26	36	......	−.12	−.20	−.10	......	......	−.04	+.10	−.18	......
Rain																						
Peninsula (J-S)	45	+.20	......	......	......	−.10	......	......	......	−.08	......	45	......	......	.00	......	......	......	+.12	......	......	......
Java (O-F)	40	......	......	+.20	......	......	......	.00	......	......	......	40	−.10	......	......	......	+.06	......	......	......	+.06	......

HONOLULU PRESSURE

In the north Pacific oscillation [9] Honolulu is very prominent in the first half year, its coefficient with Alaska based on 19 years being −0.70 in winter and −0.52 in spring. In the North Atlantic oscillation its activity is mainly confined to the summer and is relatively weak (−0.34 with Iceland and +0.20 with the Azores). In the southern oscillation it exercises in summer a very strong control as a member of the first group, having coefficients of −0.66, −0.68, −0.64 with pressure at Port Darwin in that season and the two following; and, in addition to high contemporary coefficients with Samoa, South America, and Peninsula rain, it has coefficients with conditions two quarters later (i. e., in the southern summer) of +0.50 at Samoa, −0.54 in southeast Australia, −0.42 at the Cape and +0.40 with Java rain. In autumn its influence is less, though it still gives information regarding some of the conditions in the southern summer. But in winter Honolulu behaves as a not very decided member of the second group of the southern oscillation and has coefficients of +0.38, +0.32, +0.30, and −0.32 with pressure at Port Darwin, southeast Australia and the Cape, and with Java rain; its associations with conditions two quarters before, +0.46 with Port Darwin and −0.42 with Peninsula rain, are also of this reversed type.

In spring the adherence to the first group is already setting in and there is a forecast of conditions two quarters later of −0.44 with Port Darwin and +0.60 with Samoa, together with smaller coefficients in northwest India, southeast Australia, and South America.

[9] Doctor Walker considers three great pressure oscillations as follows: (1) The North Atlantic, which consists of an accentuation of the pressure differences between the Azores and Iceland in autumn and winter, and an associated strong circulation of the winds in the Atlantic, a strong Gulf Stream, high temperatures in winter and spring in Scandinavia and the east coast of the United States, and with lower temperatures on the east coast of Canada and the west of Greenland. (2) The North Pacific oscillation: This oscillation at first sight seems to resemble that of the North Atlantic, but the meteorological observations are either wholly lacking or fragmentary, and it is therefore impossible to trace the resemblance further than that of a very general nature. (3) The southern oscillation: By the southern oscillation is implied the tendency of pressure at stations in the Pacific (San Francisco, Tokio, Honolulu, Samoa, and South America) and of rainfall in India and Java * * * to increase while pressure in the region of the Indian Ocean (Cairo, northwest India, Port Darwin, Mauritius, southeast Australia, and the Cape) decreases.—*Ed.*

CHARLESTON PRESSURE

In winter there are, apart from Alaska, four coefficients exceeding the probable value of the greatest random coefficient, and two up to 0.30; the coefficient with Alaska is of doubtful significance. Thus the position of Charleston in the North Atlantic oscillation is established and it is our first northern station to show a definite association with the positive group of the southern oscillation, the coefficients of −0.52 with northwest India and Port Darwin only occurring once in 9,000 times by accident. It is also characteristic of relations with more distant parts of the world that, as we should expect, they persist over longer periods than relations between adjacent areas, and the coefficients of Charleston winter pressure with pressure in northwest India, Port Darwin, and southeast Australia a quarter before and a quarter after are nearly as prominent as they are for the contemporary quarter. With conditions two quarters before and after the coefficients are of less significance and are in general indicative of the same relationships.

In spring Charleston continues typical of the high pressure belt in the North Atlantic oscillation (see its relations with Iceland and the Azores), and its opposition to central Siberia persists. With the season one before or behind there are five significant coefficients, and those for the previous quarter indicate that a strengthening in winter of the North Pacific oscillation (Alaska, San Francisco, Dutch Harbor) or of the southern oscillation (northwest India, Mauritius) will cause a rise of pressure at Charleston in spring. In the succeeding quarter the relations are more local. Two seasons before there is some association of high pressure with a strengthening of the southern oscillation, but two seasons later it is with a weakening (i. e., −0.40 with Honolulu −0.36, Samoa, +0.42 northwest India, and +0.34 Port Darwin).

In summer the North Atlantic relations are weaker, but similarity with San Francisco and dissimilarity with northwest India are marked.

In autumn Charleston is more isolated; its only strongly marked relations are with San Francisco in the same quarter and the two subsequent.